

MONOLITH CATALYTIC REACTOR COUPLED TO STATIC MIXER

CROSS REFERENCE TO RELATED APPLICATIONS

Phd
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This is a continuation in part of application Serial No. 09/942,839 filed on
5 August 30, 2001. *now abandoned*.

BACKGROUND OF THE INVENTION

[0001] Industrial reactions between reactant gases and liquids such as those involving
10 hydrogenation of unsaturated organic compounds and those having functional groups
capable of condensation are often performed by using finely divided powdered slurry
catalysts in stirred-tank reactors. These slurry phase reaction systems are inherently
problematic in chemical process safety, operability and productivity. The finely divided,
powdered catalysts are often pyrophoric and require extensive operator handling during
15 reactor charging and filtration. By the nature of their heat cycles for start-up and shut-
down, slurry systems promote co-product formation which can shorten catalyst life and
lower yield to the desired product.

[0002] An option to the use of finely divided powder catalysts in stirred reactors has
been the use of pelleted catalysts in fixed bed reactors. While this reactor technology
20 does eliminate much of the handling and waste problems, a number of engineering
challenges have not permitted the application of fixed bed reactor technology to the
reaction of gases with liquid organic compounds. Controlling the overall temperature rise
and temperature gradients in the reaction process has been one problem. A second
problem is that in fixed bed packed reactors there is a significant pressure drop due to
25 the high flow rates required for hydrogenation. A third problem is that liquid-gas